

What is claimed is:

1. A cardiac rhythm management device, comprising:
  - an atrial sensing channel for generating atrial electrogram signals;
  - 5 circuitry for detecting atrial senses when the atrial electrogram signal exceeds a specified threshold;
  - circuitry for measuring a time interval between successive atrial senses and for detecting a premature atrial contraction when the time interval meets a specified criterion;
- 10 a ventricular pacing channel for delivering pacing pulses to a ventricle; and,
  - circuitry for causing a ventricular pace to be delivered only when a premature atrial contraction is detected, wherein the ventricular pace is delivered at a specified AV interval following the premature atrial contraction.
- 15 2. The device of claim 1 further comprising circuitry for pacing one or more heart chambers in accordance with an atrial tracking bradycardia pacing mode when no premature atrial contraction has been detected.
- 20 3. The device of claim 1 wherein the specified AV interval is a late-pace value.
4. The device of claim 1 wherein the specified AV interval is an early-pace value.
- 25 5. The device of claim 4 wherein the AV interval is constrained so that the ventricular pace is delivered after a specified minimum interval from the previous ventricular sense or ventricular pace.

6. A cardiac rhythm management device, comprising:
  - an atrial sensing channel for generating atrial electrogram signals;
  - circuitry for detecting atrial senses when the atrial electrogram signal exceeds a specified threshold;
- 5 circuitry for measuring a time interval between successive atrial senses and for detecting a premature atrial contraction when the time interval meets a specified criterion;
  - a ventricular pacing channel for delivering pacing pulses to a ventricle;
  - circuitry for causing a ventricular pace to be delivered in accordance with an
- 10 atrial tracking bradycardia pacing mode such that a ventricular pace is delivered at a specified AV interval following an atrial sense;
  - circuitry for modifying the AV interval when a premature atrial contraction is detected.
- 15 7. The device of claim 6 wherein the AV interval is modified to a late-pace value when a premature atrial contraction is detected.
8. The device of claim 6 wherein the AV interval is modified to an early-pace value when a premature atrial contraction is detected.
- 20 9. The device of claim 8 wherein the AV interval is constrained so that the ventricular pace is delivered after a specified minimum interval from the previous sensed or paced ventricular beat.
- 25 10. The device of claim 6 wherein the bradycardia pacing mode includes AV sequential pacing.

11. A method for operating a cardiac rhythm management device, comprising:  
detecting an atrial sense when an atrial electrogram signal exceeds a specified  
threshold;  
measuring a time interval between successive atrial senses and detecting a  
5 premature atrial contraction when the time interval meets a specified criterion;  
delivering a pacing pulse to a ventricle when a premature atrial contraction is  
detected, wherein the ventricular pace is delivered at a specified AV interval following  
the premature atrial contraction.

10 12. The method of claim 11 further comprising pacing one or more heart chambers  
in accordance with a bradycardia pacing mode when no premature atrial contraction has  
been detected.

15 13. The method of claim 11 wherein the specified AV interval is a late-pace value.

14. The method of claim 11 wherein the specified AV interval is an early-pace  
value.

20 15. The method of claim 14 wherein the AV interval is constrained so that the  
ventricular pace is delivered after a specified minimum interval from the previous  
ventricular sense or ventricular pace.

25 16. A method for operating a cardiac rhythm management device, comprising:  
detecting an atrial sense when an atrial electrogram signal exceeds a specified  
threshold;  
measuring a time interval between successive atrial senses and detecting a  
premature atrial contraction when the time interval meets a specified criterion;  
delivering pacing pulses to a ventricle in accordance with an atrial tracking  
bradycardia pacing mode such that a ventricular pace is delivered at a specified AV  
30 interval following an atrial sense; and,

modifying the AV interval when a premature atrial contraction is detected.

17. The method of claim 16 wherein the AV interval is modified to a late-pace value when a premature atrial contraction is detected.

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18. The method of claim 16 wherein the AV interval is modified to an early-pace value when a premature atrial contraction is detected.

19. The method of claim 18 wherein the AV interval is constrained so that the  
10 ventricular pace is delivered after a specified minimum interval from the previous  
sensed or paced ventricular beat.

20. The method of claim 16 wherein the bradycardia pacing mode includes AV sequential pacing.

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